

C L A I M S

1. Process for recovering at least one polymer in solution in a solvent by precipitation by means of a non-solvent introduced gradually into the solution to form the precipitation medium, whereby :
 - 5 - in the course of the introduction of the non-solvent into the precipitation medium, there is first a phase separation (into a continuous phase rich in solvent, in which the polymer is dissolved, and into a disperse phase, consisting of droplets rich in non-solvent) and then there is a phase inversion (the continuous phase then becoming the phase rich in non-solvent, and the disperse phase becoming the phase rich in solvent containing the dissolved polymer)
 - 10 - the non-solvent is initially introduced into the precipitation medium in liquid form only and in a quantity (Q') which is not zero but is less than the quantity (Q) required to bring about the phase inversion, and is subsequently introduced into the precipitation medium at least partly in vapour form.
- 15 2. Process according to Claim 1, characterized in that the polymer is PVC, the solvent is MEK (methyl ethyl ketone) and the non-solvent is water.
- 20 3. Process according to either of the preceding claims, characterized in that the quantity Q' is greater than or equal to 50 % (by volume) of the quantity Q .
- 25 4. Process according to any one of the preceding claims, characterized in that the introduction time of the quantity Q' into the precipitation medium is greater than or equal to 10 minutes.
- 30 5. Process according to any one of the preceding claims, characterized in that all the non-solvent introduced into the precipitation medium after the quantity Q' has been introduced into it is in vapour form.
- 35 6. Process according to any one of the preceding claims, characterized in that the solvent and the non-solvent form an azeotrope and in that the total quantity of non-solvent introduced in vapour form is sufficient to allow the azeotropic distillation of the solvent.

7. Process according to the preceding claim, characterized in that the precipitation medium comprises two different dispersants of which one has a greater affinity for the non-solvent (dispersant I) and the other has a greater affinity for the solvent (dispersant II).

5 8. Process for recycling at least one article based on at least one polymer, whereby

- a) if necessary, the article is shredded into fragments with an average size of 1 cm to 50 cm
- b) the article or the article fragments is or are contacted with a solvent able to 10 dissolve the polymer
- c) the polymer in solution is recovered using a process according to any one of the preceding claims.

9. Process of recycling according to the preceding claim, characterized in that the said process is a closed loop process in which the solvent and the non- 15 solvent are regenerated at least in part by decantation, and in that a phase separation agent is present at least in part during the said decantation but is substantially absent during the precipitation of the polymer.

10. Process according to the preceding claim, characterized in that the phase separation agent has a greater affinity for the solvent than for the non- 20 solvent and that it is substantially removed from the regenerated solvent before the polymer is dissolved.